

**Task-focused behaviour and mothers' causal attributions
in relation to dyslexia: A follow-up from age 8 to age 20**

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ABSTRACT

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Children with dyslexia tend to find reading stressful. Coping responses, such as task-focused and avoidant behaviours, can help mitigate the stress. Task-focused behaviour is associated with reading development, with others' attributions of success and failure linked to task-focused behaviour.

The present study aims to examine whether differences in task-focused behaviour between those with dyslexia and those without dyslexia exist in childhood (age 8) and persist in adolescence (age 15) and early adulthood (age 20). The study also aimed to understand the relationship between mothers' causal attributions of their 15-year-old adolescents' school successes and failures and task-focused behaviour assessed at the three timepoints. The sample consisted of 184 participants, from the Jyväskylä Longitudinal Study of Dyslexia (JLD), categorised into three groups - dyslexics, typical readers at-risk for dyslexia, and the control group.

Results showed that task-focused behaviour was slightly stable from age 8 to age 15, but not from age 15 to 20. Although, differences between the dyslexic and control group were found in task-focused behaviour at age 8, these differences did not persist in age 15 and 20. Additionally, some correlations emerged between mothers' causal attributions of success and failure and task-focused behaviour assessed at age 8 and 15; but, not with task-focused behaviour at age 20. Group differences emerged only on ability and effort attributions of success. These findings imply that task-focused behaviour changes over time and that mothers' attributions of success and failure may cease to be related to one's task-focused behaviour as one becomes older.

Keywords: Dyslexia, task-focused behaviour, mothers' causal attributions

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1 INTRODUCTION

The way school systems are organised, reading is perhaps considered one of the most important academic goals. Poskiparta, Niemi, Lepola, Ahtola and Laine (2003) suggest that early reading experiences maybe more stressful to some children, like those with dyslexia and other reading difficulties, than others. Motivational mechanisms, such as task-focused behaviour, used as a coping response can help offset this stress. In fact, task-focused behaviour has been found to associate with improved academic performance (e.g., Jozsa & Morgan, 2014; Meece & Holt, 1993; Ruzek, Hafen, Allen, Gregory, Mikami & Pianta, 2016; Wentzel, 1996; Wigfield, Eccles, Schiefele, Roeser & Davis-Keane, 2006), educational and occupational attainment (Andersson & Bergman, 2011), and literacy development (e.g., Georgiou, Manolitsis, Nurmi & Parrila, 2010; Georgiou, Hirvonen, Liao, Manolitsis, Parrila & Nurmi, 2011), such as, phonological sensitivity (Salonen, Lepola & Niemi, 1997), “spontaneous reading acquisition” or learning to read without receiving any formal instruction (Fyrsten, Nurmi & Lyytinen, 2006, p. 569) and spelling and reading fluency (Georgiou et al., 2010; Georgiou et al., 2011). Specific to reading, studies have demonstrated a reciprocal relationship between task-avoidant behaviour and reading difficulties (Cox, 1987; Whyte, 1993). Task-avoidance, characterised by low interest and concentration, has been found to be related to poor reading skills (e.g., Deater-Deckard, Petrill, Thompson & DeThorne, 2006; Georgiou, et al., 2010) and perhaps leading to decreased improvements in reading skills (Onatsu-Arvilommi & Nurmi, 2000).

Given the link between task-focused behaviour and academic success, particularly the development of reading fluency, there have been attempts to investigate this link cross-sectionally (e.g., Fyrsten et al., 2010; Cain & Dweck, 1995; Galloway, Leo, Rogers & Armstrong, 1995). Attempts to understand the development of this link between task-focused behaviour and reading longitudinally have been limited to childhood (e.g., Deater-Deckard et al., 2006; Eklund, Torppa & Lyytinen 2013; Georgiou, et al., 2010; Hirvonen, Torppa, Nurmi, Eklund,

& Ahonen, 2016; Onatsu-Arvilommi et al., 2000) and have not extended to adolescence and early adulthood particularly among those with and without dyslexia. Towards this end, the focus of the present study is to determine whether task-focused behaviour is stable from childhood to early adulthood among those with dyslexia and without dyslexia as identified through the Jyväskylä Longitudinal Study of Dyslexia (JLD). This study also aims to explore mothers' causal attributions of school success and failures in relation to task-focused behaviour. Thus, mothers' attributions of their children's successes and failures in school during adolescence were examined.

2 TASK-FOCUSED BEHAVIOUR

For a long time, explanations of motivation were centred on the fulfilment of needs and drives, and the efforts taken in pursuit of this fulfilment. In studying motivational factors in the achievement of goals, research focus shifted from extrinsic factors, like positive and negative consequences from the environment (McClelland & Steele, 1973), to intrinsic factors, like ability or competence that are encompassed within goal-setting and goal-oriented behaviours (Dweck & Leggett, 1988). Task-focused strategies, nowadays, are commonly believed to be coping mechanisms in response to stress or mechanisms that reflect goal orientation.

Task-focused strategies such as task orientation (Salonen et al., 1997) and mastery orientation (Sideridis & Kaplan, 2011) are characterised by on-task behaviours and beliefs, namely effort, concentration and persistence on a task, and hope for success. On the other hand, task-avoidant strategies such as ego-defensive orientation (Salonen et al., 1997) are characterised by task-avoidant behaviours like withdrawal, task-irrelevant and other disruptive behaviours, low concentration, effort and persistence, a high failure expectation, and learned helplessness (Butkowsksi & Willows, 1980; Lehtinen, Vauras, Salonen, Olkinuora & Kinnunen, 1995).

2.1 Theoretical conceptualisations of task-focused and task-avoidant behaviours

Mechanisms involved in this process of attainment of goals have been reconceptualised according to various perspectives, such as goal orientations (Dweck et al., 1988; Elliot & Dweck, 2005), achievement strategies (e.g., Georgiou et al., 2011), achievement behaviours and beliefs (Aunola, Nurmi, Lerkkanen & Rasku-Puttonen, 2003), and motivational styles (Pintrich, Roeser & De Groot, 1994). Theoretically, task-focused and task-avoidant behaviours can be viewed from three perspectives – a behaviourist approach, as a function of coping, and as achievement goal orientations. According to Georgiou et al. (2011), irrespective of how terminologies are used, they are reflected in two overarching behavioural categories – task-focused and task-avoidant strategies.

Adopting a behaviourist framework, McClelland (1958) characterised task-focused and task-avoidant behaviour based on consequences from the environment (as cited in McClelland et al., 1973). Subsequent performance on a task would then be driven by a hope for success or a fear of failure. An approach orientation is activated when performance on a challenging task results in positive success (e.g., praise and satisfaction on accomplishment of a challenging task) thus, eliciting a high hope for success for future tasks. On the flip-side, when faced by extrinsic negative consequences (e.g., censure or chastisement from others), a fear of failure is triggered on subsequent tasks leading to an avoidance orientation.

Task-focused and task-avoidant behavioural strategies can also be defined from the perspective of coping (Lehtinen et al., 1995; Salonen, Lehtinen & Olkinuora, 1998). A challenging learning task can be construed as a demanding situation that may elicit stress within the individual; thus, requiring task-orientated, ego-defensive, or social dependence responses to cope (Salonen et al., 1997). Task orientation is considered adaptive as the learner engages with the task and thus exhibits task-focused behaviour. Ego-defensive orientation refers to the tendency of the individual to preserve the perception of ability through avoidance behaviour on a challenging task. Social dependence orienta-

tion refers to the tendency to blindly seek help and approval from others (for a review, see Urdan & Maehr, 1995). Task orientation is viewed as adaptive and may be construed as task-focused behaviour. Ego-defensive and social dependence orientations can be construed as maladaptive leading to task-avoidant behaviours (Lepola, Poskiparta, Laakkonen & Niemi, 2005).

From the perspective of achievement goal orientations, the perception of one's competence is crucial in determining whether to approach or avoid future tasks. Competence is referred to both the aptitude and predisposition for accomplishing a particular task, and the learning or effort spent (Dweck & Molden, 2005). Beliefs about competence, akin to intelligence, can be fixed or malleable. Task-focused and task-avoidant behaviours are manifested in mastery and performance goals within this framework (Dweck et al., 1988). The purpose of mastery goals is to develop one's skills and competence. It is the belief of process over outcome wherein the standard of achievement is internal, that is, the self. Individuals possessing a mastery goal orientation believe that ability or competence is malleable. Performance goals are aimed at demonstrating competence in comparison to an external standard, like other people. People holding performance goals believe that ability is fixed, and that an inverse relationship between time and ability exists - a person would be considered as having high ability if he or she spends lesser amount of time to accomplish a goal. Given this belief, people with this type of orientation are more likely choose easier goals so that high ability can be demonstrated, or extremely difficult goals to avoid the risk of demonstrating low ability (Elliot et al, 2005). Performance goals can further be divided into performance-oriented and performance-avoidant based on their responses and expectations from outcomes of a challenging task. Performance orientation is similar to mastery orientation in that the only difference being that individuals with performance orientation are focused on demonstrating ability. Performance-avoidant individuals adopt a defensive approach so as not to demonstrate low ability. Accordingly, the behavioural characteristics of mastery goal orientation and performance-oriented goal orientation can be categorised as task-focused behaviour and those behaviours

within performance-avoidant goal orientation can be referred to as task-avoidant behaviour. However, research suggests that mastery goals and performance goals are not mutually exclusive, rather they can exist simultaneously depending on the task at hand and are interrelated (Pintrich, 2000) and are domain-specific (Bouffard & Couture, 2003; Miller, 2010).

Task-focused behaviour and causal attributions: According to Weiner (1974), attributions answer the “why” behind people’s actions and outcomes. Causality of successful or unsuccessful achievement of goals can be attributed to external or internal factors which in turn could influence the tendency to approach or avoid future challenging tasks. Attributions may be intrapersonal or interpersonal and exist on three dimensions – locus, stability, and controllability. Locus refers to attributions to internal (e.g., skill) or external (e.g., chance) factors; stability refers to stable or unstable attributions over time; and, controllability refers to attributions that are perceived to be within one’s control or not (Försterling, 2001). In situations of success on a task, if the individual attributes it to internal factors, then that would lead to increased engagement on the next task. But in the case of failure, internal attributions can potentially lead to withdrawal, helplessness, and disengagement from similar challenging tasks in the future (Sideridis et al., 2011). Whether attributions are believed to be stable and uncontrollable (e.g., “I’m smart” or “I’m a failure”), or unstable and controllable (e.g., “I need to learn more” or “I know a lot about this topic”), could also affect one’s inclination to approach or avoid a challenging task (Seifert, 2004).

The decision of whether to actively engage or avoid a task typically follows a process within the context of learning. Firstly, individuals develop beliefs from earlier similar challenging learning tasks, perhaps experiencing anticipation and other related emotions (Pintrich et al., 1994). These beliefs in turn orient individuals’ goal-setting behaviour (see for e.g., Pintrich, Marx, & Boyle, 1993), designing strategies in pursuit of set goals, observing behaviour in the use of strategies (Pintrich et al., 1994), and subsequently investing necessary effort (Dweck et al., 1988). Finally, attributions, drawn in the process of success-

ful or unsuccessful achievement, influence beliefs about competence and the likelihood of engaging in future learning tasks of a similar nature. Thus, this impacts performance on a challenging task (Elliot et al, 2005).

An individual's self-beliefs are also shaped by others' perceptions of competence based on observations of performance on challenging tasks. Interpersonal causal attributions of success or failure situations made by a close observer, such as a parent or teacher, are likely to be different from attributions made by the child (Elliot et al., 2005). Others' internal, stable, and controllable attributions of success on a challenging task are likely to lead to engaging with future challenging tasks (i.e., more task-focused behaviour) especially as such attributions influence one's self-concept, self-esteem, and perceptions of competence. (Hong, Chiu, Dweck, Lin & Wan, 1999). This may be due to the dimension of controllability wherein attributions about positive or negative outcomes by observers are primarily dependent on whether these outcomes are viewed as within the control of the individual. For instance, academic failure is attributed to a lack of effort or ability if the actor was perceived as being in control of the outcome; effort-based attributions are considered unstable and controllable and ability-based attributions are viewed as fixed, inherent and uncontrollable (Weiner, 2000). Based on performance on a task and behaviours observed while performing the task, conversely, influence parental attributions of success and failure (see Yee & Eccles, 1988; Rätty, Vänskä, Kasanen & Kärkkäinen, 2002). Furthermore, parental attributions of children's competence predicted task-focused behaviour which in turn predicted better performance in reading (Aunola, Nurmi, Niemi, Lerkkanen, Rasku-Puttonen, 2002) and math (Aunola et al., 2003).

2.2 Assessing the development of task-focused behaviour

The development of task-focused behaviour in learning tasks across time has been examined through various modes of evaluation. Typically, the development of task-focused and task-avoidant behaviour have been examined through

teacher, parent, or self-reports through recall of situations where such behaviours were exhibited. While these instruments may be based on subjective evaluations (Onatsu-Arvilommi et al., 2000), they go beyond transitory and situational behavioural observations. Using teacher reports, Hirvonen et al. (2016) found that task-avoidant behaviour did not change from kindergarten to Grade 2 but there was a decrease from Grade 2 to Grade 3. Jozsa et al. (2014) found that on-task behaviours on school tasks among Hungarian Grade 4 students changed four years later when again assessed at Grade 8. Genetic studies have recently been attempted to study the development of task-focused behaviour. Twin studies, with monozygotic and dizygotic twins, have found that individual differences on task-focused behaviour, if stable, was due to genetic influences and if unstable, was due to the environment, specifically the individual's nonshared environment (Deater-Deckard et al., 2006; Deater-Deckard, Petrill & Thompson, 2007). Nonshared environments include parent-child interactions, peer influences, relationships in school, even sibling-sibling interactions. Task-focused behaviour over time has also been measured using observations of the amount of time spent on a task and certain behavioural cues (e.g. Andersson et al, 2011; Sideridis et al., 2011). However, it is important to note that just because an individual spends a considerable time on a task it does not imply that the individual is actively engaging with the task, demonstrating high concentration and effort on a challenging task.

2.3 Task-focused behaviour and reading – a reciprocal relationship

Stanovich (1986) posited that difficulties in reading may lead to “behavioural/cognitive/motivational spinoffs” (p.389) that can further exacerbate the divide between skilled and poor readers resulting in Mathew effects in reading wherein the skilled reader becomes more skilled and a poor reader becomes a poorer reader. Early successful reading experiences may lead to a high success expectancy (hope for success) that influences positive self-beliefs like, self-

concept and efficacy beliefs and thus would increase the likelihood of approaching future reading tasks (e.g., Eccles, Midgley, Wigfield, Buchanan & Reuman, 1993). On the other hand, children with poorer early reading skills have more negative reading experiences which in turn may lead to strong failure expectancies (fear of failure) that could lead to negative self-beliefs and so would be reluctant to take on similar reading experiences, that is resulting in more task-avoidance in reading (e.g., Deater-Deckard et al., 2006; Georgiou et al., 2010; Nurmi, Aunola, Salmela-Aro & Lindroos, 2003). This suggests that the relationship between reading and task-focused behaviour is reciprocal in nature.

The act of reading consists of a set of knowledge and skills that must be adeptly simultaneously coordinated between reading sub-processes that can be largely categorised into decoding and comprehension (Gough, Hoover & Peterson, 1996). Several studies have found that task-focused behaviour is associated with performance on reading tasks. For instance, Lepola, Salonen & Vauras (2000), found that progression of early word reading was related to increased task-focused behaviour as characterised by task-orientated coping. Poor early word reading was associated with increased avoidance behaviour characterised by social-dependence and ego-defensive coping. In fact, some studies have also demonstrated that task-focused behaviour predicts reading outcomes. In one such study (Stephenson, Parrila, Georgiou & Kirby, 2008) examining Canadian children from kindergarten to Grade 1, it was found that after controlling for emergent reading skills, like phonological sensitivity and letter knowledge, task-focused behaviour predicted word reading in Grade 1. Lundberg and Sterner (2006) studied sixty Swedish-speaking children from Grade 3 to 4 and found that task orientation, measured by teachers' observations of the children's attention and concentration, mediated reading development from Grade 3 to Grade 4. Further it predicted increase in reading skills, namely word decoding and reading comprehension, in Grade 4. Results from the study by Lepola et al. (2005) revealed that the contribution of kindergarten-level letter knowledge and preschool-level phonological awareness to word reading in

Grade 1 was mediated by task orientation in kindergarten. Findings from these studies imply that over and above prior cognitive skills, task-focused behaviour predicts reading skills which in turn predicts subsequent task-focused behaviour.

Moreover, this relationship continued into later years. For instance, results from another study (Hirvonen, Georgiou, Lerkkanen, Aunola & Nurmi, 2010) comprising of Finnish-speaking pre-school children followed till Grade 4, showed that task-focused behaviour predicted development of reading skills. Taking into account prior reading skills assessed by letter knowledge and phonological awareness, task-focused behaviour measured a year earlier predicted reading comprehension and spelling, but not reading fluency. Task-focused behaviour at this level was influenced by prior reading fluency, comprehension and spelling after controlling for earlier levels of task-focused behaviour. This relationship continued until Grade 4.

In confirming the reciprocal relationship between task-focused behaviour and reading, research has even gone a step further to demonstrate the snowballing effect of maladaptive task-avoidant strategies with respect to reading wherein task avoidance can act both as a consequence of difficulties in initial reading acquisition and as a cause of future reading failure (Lepola et al., 2005; Morgan & Fuchs, 2007) further exacerbating the gap between skilled and less skilled readers (Stanovich, 1986). Onatsu-Arvilommi et al. (2000) found that 6- to 7- year old Finnish children who exhibited task-avoidance had poorer reading skills, namely syllable recognition and reading comprehension, which in turn corresponded to an increase in subsequent task-avoidance. This could be because poor readers may be more likely to avoid engaging in reading tasks that were necessary to improve reading skill than skilled readers (Morgan, D. Fuchs, Compton, Corday & L. Fuchs, 2008).

2.3.1 Task-focused behaviour across orthographies

Task-focused behaviour in relation to reading has been observed to vary across orthographical depth (e.g., Georgiou et al., 2010; Hirvonen et al., 2010) with

reading acquisition, and conversely problems in reading, differing across languages with varying levels of complexity or orthographic depth (e.g., Aro & Wimmer, 2003; Georgiou, Parrila & Liao, 2007; Georgiou, Parrila & Papadopoulos, 2008; Landerl & Wimmer, 2008; Mann & Wimmer, 2002; Parrila, Aunola, Leskinen, Nurmi & Kirby, 2005; Wimmer & Goswami, 1994). Seymour, Aro and Erskine (2003) categorised orthographies of 13 European languages; at one end, Finnish was classified as a shallow or transparent orthography and at the other end English as a deep or opaque orthography. Shallow orthographies are based on one-to-one mappings of graphemes and phonemes, while deep orthographies have an “inconsistent bi-directional one-to-many mappings” (Seymour et al., 2003, p. 166). They surmise that reading acquisition occurs relatively quicker in shallow orthographies than in deep or opaque orthographies.

The more complex or opaque the orthography, the more challenging the reading task is considered, and thus motivational mechanisms can aid in the reading process especially in opaque orthographies. Manolitsis, Georgiou, Stephenson and Parrila (2009) found that task-focused behaviour at kindergarten had a stronger influence in predicting Grade 1 nonword decoding in English than in Greek; Greek being orthographically similar, except for differences in spelling (Hirvonen et al., 2010), to Finnish. In that respect, Hirvonen et al. (2010), examined task-focused behaviour among Finnish preschool children at Grade 1, 2 and 4, and surmised that because of the regular phoneme-grapheme correspondence, learning to read in Finnish may be considered easier, and hence, task-focused behaviour may not exert a significant influence. However, this effect of task-focused behaviour on orthography may be limited to the early years, as in the case of the study by Manolitsis et al (2009), but not in later years (Georgiou et al., 2011).

2.3.2 Task-focused behaviour and dyslexia

Dyslexia is a developmental disorder with a neurological basis and a strong genetic predisposition characterised by difficulties in reading and/or spelling (Punt, De Jong, De Groot & Hadders-Algra, 2013). According to Lyon et al.

(2000), dyslexics usually have difficulties in accurate and/or fluent word recognition and have poor spelling and decoding abilities (as cited in S. E. Shaywitz & B. A. Shaywitz, 2005; Snowling, 2013). In the context of Finnish, a transparent orthography with regular phone-grapheme correspondence, decoding may be relatively easier than in an opaque orthography. However, according to Lyytinen, Leinonen, Nikula, Aro and Leiwo (1995) difficulties in reading may arise with the doubling up of phonemes or phoneme duration. Words with phoneme duration, such as *tuli* - fire, *tulli* -customs, *tuuli* - wind, possess different meanings (as cited in Leinonen, Muller, Leppänen, Aro, Ahonen & Lyytinen, 2001). Problems in reading comprehension can arise as a secondary consequence to difficulties in decoding (Lyon, S.E. Shaywitz & B.A. Shaywitz, 2003).

The act of reading requires the reader to match phonology with its corresponding orthography and so problems in representing and using phonological information could hinder reading acquisition (Goswami & Bryant, 1990). According to the phonological deficit hypothesis, children with dyslexia have impairments in representing, storing, and retrieving phonological information (refer to Ramus, 2003; Ramus, Rosen, Dakin, Day, Castellote, White & Frith, 2003; Snowling, 1998). Besides deficits in phonological awareness, more recent research suggests that deficits in visual attention could also impair reading fluency (e.g., Franceschini, Gori, Ruffino, Pedrolli & Facoetti, 2012; Gabrieli & Norton, 2012). These studies imply that poor phonological awareness could be a consequence of “poor orthographic inputs (i.e., visuo-spatial deficits) being fed into the neural regions that mediate the phoneme-grapheme correspondence” (Vidyasagar & Pammer, 2009, pp.62). Because deficits in reading is prevalent among those with dyslexia, reading may be considered a challenging task. Thus, underlying motivational mechanisms, like task-focused behaviour, may be important for them to have successful reading experiences (Gindrich, 2004; Lodygowska, Chec & Samochowiec, 2017).

Research examining the relationship of task-focused behaviour and dyslexia have yielded mixed results with studies reporting differences in task-focused behaviour between those with and without dyslexia (e.g., Eklund et al.,

2013; Polychroni, Koukoura & Anagnostou, 2006; Poskiparta et al., 2003) and some demonstrating no difference (e.g., Lockiewicz, Bogdanowicz & M. Bogdanowicz, 2014). This may be due to age-related factors since those studies which demonstrated differences in task-focused behaviour were centred on childhood. For instance, Eklund et al. (2013), in the early stages of the JLD study, found that Grade 1 and 2 Finnish children with a high early cognitive risk for dyslexia but who had not developed reading disabilities were more task-focused than those having a high early cognitive risk for dyslexia with reading disabilities. Similarly, those with a low early cognitive risk with reading disabilities were more task-avoidant than those with a low early cognitive risk and who did not have reading disabilities; establishing that a lack of task-avoidant behaviour was a protective factor. Similar results were found in the study by Poskiparta et al (2003) wherein poor readers, with no reading disorder diagnosis, in Grades 1 and 2 were found to be more task-avoidant than good readers. In yet another study, fifth- and sixth-grade Greek students diagnosed with dyslexia were found to engage in a surface approach to learning, exhibiting avoidant behaviours during the task (Polychroni et al., 2006). However, no difference in persistence behaviours was between Polish adults with and without dyslexia (Lockiewicz et al., 2014). Particular to family risk for dyslexia, Fyrsten et al. (2006) explored task avoidance among 200 Finnish children, aged 5 and 6½ years, with and without a family risk for dyslexia from the JLD study. Their findings revealed that 5-year-old children, who were deemed as skilled verbally, exhibited more task-focused behaviours than when at 6½ years. However, belonging to the at-risk or control group did not predict children's task-avoidant behaviour in this study.

2.3.3 Attributions and dyslexia

Several studies have shown that adolescent dyslexics tend to employ self-handicapping strategies, characterised by external attributions, so as to not to reveal a lack of ability, especially on reading tasks (Alexander-Passe, 2008; Butkowsky et al., 1980). Children with learning disabilities are more likely to

attribute their difficulties and failures to internal factors such as ability and effort when compared to their peers (Licht, Kistner, Ozkaragoz, Shapiro & Clausen, 1985; Pearl, 1982; Pearl, Bryan, & Donahue, 1980). An early study by Licht et al. (1985) found that those with learning disabilities were more likely to attribute failures to internal factors, such as insufficient ability, than those without learning disabilities. Even in the case of difficulties in reading without a diagnosis for a reading disability, compared to more competent readers, failure of less competent readers was found to be attributed more strongly to internal factors, such as a lack of ability, and successes to external factors (Butkowsky et al., 1980).

Inferences attributing causality of a success or failure outcome, not just by the self, but also by others, shape one's perception about his/her ability to perform on reading (Butkowsky et al., 1980). While parents tend to resort to "developmental optimism", as termed by Coplan, Hasting, Lagace-Seguin & Moulton (2002), where success, in general, is attributed to their child's ability or effort and failure to external causes (as cited in Natale, 2007, p.15; Tollison, Palmer & Stowe, 1987), there are differing trends observed in parental attributions among children with poorer skills and difficulties. For instance, O'Sullivan and Howe's (1996) study demonstrated that parental attributions of Grades 3, 6, and 9 children from low-income Canadian families on reading outcomes found that poor reading outcomes, as grade level increased, evolved from external attributions, namely task difficulty, material and teaching, to internal attributions, namely ability, effort and dislike. There seems to be a dearth of studies that examine mothers' causal attributions in association with their children's dyslexia.

Parents of children with learning disabilities are more likely to attribute failures to internal and stable factors (Johnston, Reynolds, Freeman & Geller, 1998). This could be due to the controllability dimension wherein failure is perceived to be in the hands of the individual. However, parents of children with more severe learning disabilities attributed difficulties to internal, stable and uncontrollable factors (Hartley, Schaidle & Burnson, 2013). So long as adoles-

cents with learning disabilities are perceived as in control of their own learning (controllability dimension), they are more likely to make the greatest learning gains (Kistner, Osborne & LeVerrier, 1988) and therefore, more likely to engage in challenging tasks (Tõeväli & Kikas, 2017). However, adolescents with dyslexia are more likely to attribute their own successes and failures to uncontrollable factors than their counterparts (Fredrickson & Jacobs, 2001).

Specific to children with a family risk of dyslexia, Natale (2007) studied mothers' causal attributions of children with and without a familial risk of dyslexia, also from the JLD study. It was demonstrated that mothers' attributions of their children's success or failure differed over time depending on the presence of a family risk for dyslexia. Ability-based attributions of reading success from mothers of children from the familial risk group decreased during the first school year, while ability-based attributions increased in the control group. Attributions for reading success were more due to task ease for those in the at-risk group, whereas reading success in the control group was attributed to ability and effort. Furthermore, mothers of children with a family risk of dyslexia explained reading failures to a lack of ability and effort when compared to mothers of children without a family risk of dyslexia.

The present study focuses on mothers' attributions of their 15-year-old child's achievement in school, specifically school tasks for two reasons. First, adolescents with dyslexia tend to attribute successes and failures to uncontrollable factors (Jones & Nisbett, 1971) and thus, are likely to develop lower self-concept, self-esteem, and higher expectations of failure (Jacobsen, Lowery & DuCette, 1986) and can often lead to debilitating consequences (Pearl, 1982). This tendency to externalise success and internalise failures is further compounded when those with learning difficulties make comparisons to peers without learning disabilities (Humphrey & Mullins, 2002). Parents on the other hand are likely to view difficulties and failures of their dyslexic children as more controllable; thus, holding them accountable for their failures (Bryan, Pearl, Zimmerman & Matthews, 1982). Secondly, attributions made by a close observer, such as a parent, are an integral influence that shape one's percep-

tions of competence (Weiner, 2000), self-worth and self-efficacy (Eccles, 1983) in turn influencing task-focused behaviour (Tõeväli et al., 2017).

3 THE PRESENT STUDY

As noted earlier, there appears to be a reciprocal and cumulative relationship between task-focused behaviour and reading (Onatsu-Arvilommi et al., 2000). Experiencing success or failure on prior reading tasks could potentially increase the likelihood of engaging (i.e., task-focused behaviour) or avoiding (i.e., task-avoidance behaviour) subsequent reading tasks, especially since it influences one's beliefs of competence. Succinctly stated, the achievement goal theory posits that an individual's goal-orientation is influenced by the perception of one's competence which is shaped by one's and others' attributions of successful or unsuccessful attempts to achieve goals. Whether individuals decide to engage or avoid future challenging tasks depends upon this belief of competence.

The present study aims to examine task-focused behaviour among those with and without dyslexia at childhood (age 8), adolescence (age 15) and early adulthood (age 20), and mothers' causal attributions assessed at age 15 in relation to task-focused behaviour measured at the three timepoints. While there are studies that examine task-focused behaviour longitudinally, they are limited to childhood (e.g. Eklund et al., 2013; Polychroni et al., 2006; Poskiparta et al., 2003). Studies that investigate task-focused behaviour among adults with and without dyslexia are cross-sectional (e.g., Lockiewicz et al., 2014). Unlike prior research, this study focuses on investigating task-focused behaviour over a long period of time, that is, from childhood to adulthood in order to understand the development of task-focused behaviour. Furthermore, prior research on mothers' causal attributions in relation to their children's task-focused behaviour specific to reading (Aunola et al., 2002), including those with and without dyslexia (e.g., Natale, 2007; Natale, Aunola, Nurmi, Poikkeus, Lyytinen & Lyytinen, 2008), have also been limited to childhood. Because adolescence is seen as a pe-

riod of transition into independence (Brown, 1990), this study also examines mothers' causal attributions of their adolescent children's success and failures in relation to childhood, adolescence and adulthood task-focused behaviour among those with and without dyslexia.

3.1 Research Questions and Hypotheses

The following are the research questions posed by this study:

(a) Does task-focused behaviour of individuals remain stable over time, that is from childhood (age 8), adolescence (age 15) to early adulthood (age 20)? Based on findings from Hirvonen et al. (2016) and Jozsa et al. (2014), where task-focused behaviour changed as participants grew older, it is hypothesised that task-focused behaviour will not remain stable from age 8 to age 20.

(b) Are there differences between those diagnosed with dyslexia, typical readers with a familial risk for dyslexia, and typical readers without a familial risk for dyslexia in task-focused behaviour at age 8, 15, or 20? In line with studies that demonstrated group differences on task-focused behaviour between those with and without dyslexia in the early years (Eklund et al., 2013; Poskiparta et al., 2003) and in late childhood (Polychroni et al., 2006) but not during adulthood (Lockiewicz et al., 2014), it is expected that task-focused behaviour will differ among the three groups at age 8, but not at age 15 and age 20.

(c) Are mothers' attributions of success and failure at age 15 related to children's task-focused behaviour at age 8, 15 and 20? Mothers' attributions of successful or unsuccessful achievement of their children's goals have been found to be related to task-focused and task-avoidant behaviour during childhood (Aunola et al., 2002). However, there does not seem to be research examining mothers' causal attributions of adolescents' successes and failures in school in relation to task-focused behaviour. Furthermore, because attributions made by others are based on behaviours exhibited whilst performing a task (Yee et al., 1988), it is

expected that mothers' causal attributions of their 15-year old adolescents' successes and failures in school will be related to task-focused behaviour at age 8 and that there will be no relation between mothers' causal attributions at age 15 and task-focused behaviour at age 15 and 20.

(d) Do the three groups differ on the type of causal attributions of school success and failure reported by their mothers at age 15? This study hypothesises that there will be group differences in mothers' causal attributions with mothers of children in the dyslexic group attributing school success to external factors and school failures to internal factors (Friedman & Medway, 1987; Johnston et al., 1998; Pearl, 1982; Pearl et al., 1980; Rogers & Saklofsky, 1985).

3.2 Methods

3.2.1 Participants

The participants ($n = 184$) in this study belonged to the Jyväskylä Longitudinal Study of Dyslexia (JLD) who were followed from birth to early adulthood (age 20). The families were selected with the help of maternity clinics in Central Finland between 1993 and 1996. Children were identified as at-risk for developing dyslexia if they were born to families where at least one parent was diagnosed with dyslexia and some other relative was reported to have reading difficulties. Participants without family risk for dyslexia were selected to be in the control group.

The families were recruited in a three-stage process. Firstly, a questionnaire with three questions on difficulties pertaining to learning to read and spell among themselves and their close relatives. Then, a detailed questionnaire pertaining to demographic information, occurrence of reading and writing difficulties in childhood and adulthood and among relatives, persistence of reading and writing difficulties and reading habits. In the final stage, tests of reading and spelling skills of parents and reports of reading and writing difficulties of

their close relatives and performance in diagnostic tasks of reading and writing (see Leinonen et al. 2001).

Reading difficulties of the participants was based on the following criteria at the end of the second grade when the participants were about 8.9 years (see Eklund et al., 2013; Puolakanaho, Ahonen, Aro, Eklund, Leppänen, Poikkeus, Tolvanen, Torppa & Lyytinen, 2007):

(a) A cut-off point using the 10th percentile of the control group's performance on word reading accuracy and speed, text reading accuracy and fluency, nonword text reading accuracy and fluency, "Lukilasse" word list reading fluency and spelling accuracy was adopted. Children who scored on or lower than the 10th percentile on each task were considered to have deficient skills.

(b) To be classified as having a reading disability, children who scored at or below the 10th percentile either on at least three of four accuracy measures or at least three of four fluency measures; or, two accuracy measures and two fluency measures.

The participants were thus classified into three groups: 1) children with dyslexia (n=43), 2) typical readers having a familial risk of dyslexia (n=62), and 3) typical readers from the control group (n=76). Three children from the control group had dyslexia later on and thus were omitted from further analyses.

3.2.2 Measures

Task-focused behaviour: For the purpose of this study, parental reports of task-focused behaviour when the children were aged 8, and self-reports of task-focused behaviour when the participants were 15 years and 20 years were used. Task-focused behaviour was measured using five questions from the Behavioural Strategy Rating Scale (Eklund et al., 2013; Onatsu-Arvilommi et al., 2000) – (a) When facing difficulties, does the child have a tendency to find something else to do instead of focusing on the task at hand? (b) Does the child actively try to solve even the most difficult tasks? (c) Does it seem that the child easily gives up the task at hand? (d) Does the child show persistence when working with

the tasks? (e) When problems occur with a task, does the child turn his or her attention to other things?

Responses were on a five-point Likert scale (from 1 to 5) to rate the extent how well the statements fit the behaviour with 1 being not at all and 5 being to a great extent. Responses for questions (a), (c) and (e) were reversed to indicate task-focused behaviour. Means of the five items were calculated at each age. The measures at 8, 15 and 20 years were found to be reliable ($\alpha=.88$, $\alpha=.74$ and $\alpha=.82$, respectively).

Mothers' causal attributions: Mothers' causal attributions of their children's successes and failures were obtained when the participants were 15. Mothers' causal attributions were measured using four statements pertaining to attributions in school overall and in school tasks wherein two statements comprised of success in school overall and in school tasks (e.g. "If child does well in school, that's because..." and "If child does well in school tasks, that's because...") and two statements involving failure in school overall and in school tasks (e.g. "If child doesn't do well in school, that's because..." and "If child doesn't do well in school tasks, that's because..."). Mothers attributed success or failure in school and school tasks to ability, effort, teaching and task difficulty. Mothers ranked their children's success according to four options - *the teaching/guidance has been good* (teaching), *the child tries hard* (effort), *the child has abilities* (ability), and *the tasks have been too easy for the child* (task difficulty). Similarly, mothers ranked their children's failures according to four options - *the teaching/guidance has not been good enough* (teaching), *the child does not try hard enough* (effort), *the child has poor abilities* (ability) and *the tasks have been too difficult for the child* (task difficulty). For each of the causal attributions, one mean score of the mothers' responses was calculated separately for success and failure situations (see Natale et al., 2008).

Reliability (Cronbach's alpha) for mothers' causal attributions for their children's success in school was .75 for teaching attribution, .86 for effort attribution, .85 for ability attribution and .82 for task difficulty attribution; and,

Cronbach's alpha for mothers' causal attribution of their children's failure in school was .85 for teaching attribution, .85 for effort attribution, .88 for ability attribution and .86 for task difficulty attribution.

3.3 Ethical Considerations

Researchers must be aware of the potential ethical considerations when involving children and minors in studies so that their rights are safeguarded. The Jyväskylä Longitudinal Study of Dyslexia (JLD) received approval from the Ethical Committee of the University of Jyväskylä. Participants were recruited after obtaining consent from parents or legal guardians and participation was voluntary. Identity of participants was protected to ensure full anonymity and their data obtained was preserved in secure server with the aim of protecting their privacy. Finally, it was ensured throughout the study that no harm was done to the participants.

4 RESULTS

To assess normality for task-focused behaviour measured at age 8, 15 and 20 and mothers' causal attributions assessed at age 15, a Kolmogorov-Smirnov test was used and was not found to be normally distributed (Table 1). However, despite the rather small skewness and kurtosis values, data resembled a normal distribution for task-focused behaviour measured at all three ages, that is age 8, 15 and 20 and mothers' causal attributions of their children's successes and failures in school at age 15 (Table 1).

TABLE 1 Descriptive statistics of the observed variables

Variables	N	M	SD	Kolmogorov- Smirnov Test	Skewness	Kurtosis
<i>Age 8</i>						
Task-focused Behaviour	184	2.50	0.81	.034	-.218	-.339
<i>Age 15</i>						
Task-focused behaviour	153	2.89	.69	.015	-.069	-.477
Mothers' causal attributions						
<u>School Success:</u>						
Ability	144	1.66	.84	.000	1.190	.649
Effort	144	2.27	.99	.000	.239	-1.092
Teaching	139	2.44	.73	.000	-.265	-.445
Task	138	3.49	.82	.000	-1.516	1.322
<u>School Failure:</u>						
Ability	134	3.43	.82	.000	-1.464	1.530
Effort	148	1.72	.88	.000	1.119	.337
Teaching	137	2.29	.79	.000	.082	-.655
Task	135	2.44	1.04	.000	.249	-1.221
<i>Age 20</i>						
Task-focused behaviour	168	3.11	.62	.000	-.735	.580

4.1 Stability of task-focused behaviour

To ascertain stability of task-focused behaviour, Pearson's Correlation was used. Table 2 presents the correlation coefficients between the assessments of task-focused behaviour at the three ages. Although significant positive correlation between task-focused behaviour measured at age 8 and age 15 was obtained ($r=0.17$), the correlation was rather small. Moreover, no significant correlations between task-focused behaviour at age 15 and at age 20 emerged. This suggests that task-focused behaviour was somewhat stable until the age of 15 but not later on.

TABLE 2 Correlations of Task-Focused Behaviour Measured at Age 8, 15 and 20

Task-Focused behaviour	1	2	3
Age 8	-		
	N = 184		
Age 15	.173*	-	
	N = 141	N = 153	
Age 20	.064	.076	-
	N = 154	N = 135	N = 168

* $p \leq .05$

4.2 Group differences on task-focused behaviour

One-way ANOVA was used to compare task-focused behaviour among the three study groups: dyslexic, typical readers with family risk, and typical readers without family risk (table 3). Based on results from the one-way ANOVA, task-focused behaviour differed significantly between the groups at age 8 [$F(2,178) = 4.16, p = .02, \eta^2 = .05$]. Eta-squared yielded a small effect size, however. Group differences did not exist for age 15 and age 20.

Furthermore, post-hoc comparisons using Bonferroni corrections indicated that the mean score of task-focused behaviour at age 8 for those belonging to the dyslexic group was significantly lower than typical readers from the control group. However, differences of task-focused behaviour mean scores between the dyslexic group and the typical readers with familial risk and those of typical readers with familial risk and typical readers from the control group were not significantly different. This implies that while there seems to be differences between the groups on task-focused behaviour at age 8, these group differences become insignificant at age 15 and consequently at age 20 and that this significant difference at age 8 is a result of differences between the dyslexic group and the typical readers from the control group.

TABLE 3 Descriptive statistics and group differences of task-focused behaviour at each age

Age	Dyslexic			Typical reader - risk			Typical reader - control			df	F
	N	Mean	SD	N	Mean	SD	N	Mean	SD		
8 years	43	2.21 ^a	.87	62	2.53 ^{a,b}	.84	76	2.65 ^b	.72	2,178	4.163*
15 years	27	2.89	.64	55	2.83	.65	71	2.92	.76	2,150	.254
20 years	34	3.18	.77	61	3.09	.58	71	3.11	.56	2,163	.264

^{a&b} Post-Hoc comparisons using Bonferroni corrections: groups with significant differences have different superscript letters

* $p < .05$

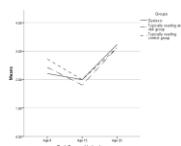


FIGURE 1. Development of task-focused behaviour of the three groups

In order to examine the development of task-focused behaviour across time among the three groups, a 3X3 (time x group) repeated measures ANOVA

was performed. A main effect for time (i.e., the three ages) was found to be significant for task-focused behaviour using Pillai's Trace [$F(2,121) = 101.73$, $p=.000$, $\eta^2=.627$] with a large effect size yielded by Partial Eta-squared. As observed from figure 1, task-focused behaviour is seen to decrease from age 8 to age 15 and then consequently increase till age 20 across all three groups. There was no interaction effect for time and groups using Pillai's Trace. That is, there were no significant group differences in change of task-focused behaviour across time [$F(4,244) = 2.33$, $p=.057$]. Furthermore, between-subject effects for the dyslexia groups were found to be statistically insignificant [$F(2,122) = 2.00$, $p=.14$] which also confirmed that between-group differences on task-focused behaviour across time were insignificant.

4.3 Mothers' causal attributions and task-focused behaviour

To evaluate whether mothers' causal attributions measured at age 15 were related to task-focused behaviour measured at age 8, age 15 and age 20, Pearson's correlation was conducted (Tables 4 and 5). Specific to school success, task-focused behaviour at age 8 had a significant negative correlation to ability-based attributions ($r=-.17$) and a positive correlated to task-based attributions ($r=.26$) as reported by their mothers at age 15. At age 15, task-focused behaviour had a significant negative correlation with teaching-based attributions ($r=-.22$). Correlations at age 8 and 15 seemed to be small. No significant correlations were obtained between task-focused behaviour at age 20 and mothers' causal attributions. To put it simply, the more task-focused behaviour is exhibited at age 8, the less likelihood that mothers attribute success to the child's ability, and the more likelihood that mothers attribute success to task ease. Furthermore, it seems that the more task-focused behaviour is exhibited at age 15, the lesser likelihood mothers' attribute success to teaching factors.

TABLE 4 Correlations of mothers' causal attributions at age 15 and task-focused behaviour at age 8, 15 and 20 for school success outcomes

Variable	1	2	3	4	5	6	7
1 Task-focused behaviour at age 8	-						
2 Task-focused behaviour at age 15 N = 141	.173*	-					
3 Task-focused behaviour at age 20 N = 154 N = 135	.064	.076	-				
4 Ability attribution N = 136 N = 123 N = 126	-.173*	.023	-.026	-			
5 Effort attribution N = 135 N = 121 N = 126 N = 137	-.141	.004	-.009	-.509**	-		
6 Teaching attribution N = 131 N = 118 N = 122 N = 137 N = 137	-.002	-.220*	-.122	-.277*	-.259**	-	
7 Task attribution N = 130 N = 116 N = 120 N = 137 N = 137 N = 137	.264**	.159	.121	-.196*	-.440**	-.288*	-

* $p < .05$, ** $p < .01$

TABLE 5 Correlations of mothers' causal attributions at age 15 and task-focused behaviour at age 8, 15 and 20 for school failure outcomes

Variable	1	2	3	4	5	6	7
1 Task-focused behaviour at age 8	-						
2 Task-focused behaviour at age 15 N = 141	.173*	-					
3 Task-focused behaviour at age 20 N = 154 N = 135	.064	.076	-				
4 Ability attribution N = 126 N = 113 N = 118	.028	.192*	-.114	-			
5 Effort attribution N = 139 N = 126 N = 130 N = 134	.117	.155	.142	-.195*	-		
6 Teaching attribution N = 129 N = 115 N = 121 N = 134 N = 135	-.106	-.250**	.075	-.132	-.383**	-	
7 Task attribution N = 127 N = 113 N = 118 N = 134 N = 134 N = 134	-.091	-.121	-.090	-.517**	-.412**	-.320**	-

* $p < .05$, ** $p < .01$

With respect to school failure, no significant correlations were obtained between mothers' causal attributions and task-focused behaviour assessed at age 8 and 20. However, task-focused behaviour assessed at age 15 had a significant negative correlation with teaching-based attributions ($r=-.25$) reported by their mothers and a significant positive correlation with ability-based attribution ($r=.19$), although the correlations were not strong. That is, the more task-focused behaviour is exhibited the less likelihood mothers attribute their child's failure to poor teaching and the more likelihood of attributing school failure to their children's ability.

4.4 Group differences on mothers' causal attributions

One-way ANOVA was used to determine if the dyslexic group and typical readers from the at-risk and control group differed on mothers' attributions of school successes and failures measured at age 15 (Table 6). Because of the violation of the homogeneity of variance assumption of task-based attribution of success and failure outcomes, the nonparametric Kruskal-Wallis test was used. There were statistically significant differences between the three groups on only two attribution types - ability and effort attributions of school success [$F(2,141) = 13.41, p=.000, \eta^2=.16$ and $F(2,141) = 3.816, p=.023, \eta^2=.05$, respectively]. Eta-squared suggested a large effect for group differences in mothers' ability-based attributions of their children's school success and a small effect for effort-based attributions of school success.

Furthermore, post-hoc comparisons using Bonferroni corrections indicated that the mean score for mothers' effort attributions of school success in the dyslexic group was significantly lower than the typical readers from the control group (Mean difference=-.581, $p = .022$). However, mean scores for mothers' ability attributions of school success in the dyslexic groups were significantly higher than that of the typically reading at-risk group (Mean difference=-.666, $p = .001$) and the typically reading control groups (Mean difference=-.886, $p = .000$). Taken together, these results indicate that group differences in effort

attributions were due to differences between the dyslexic group and the typically reading control group; and that group differences in ability attributions were due to differences between the dyslexic group and typically reading at-risk group and differences between the dyslexic group and the typically reading control group.

TABLE 6 Descriptive statistics and group differences of mothers' causal attributions at age 15

Outcome	Attribution	Dyslexic		Typical reader - Risk		Typical reader - Control		df	F
		Mean	SD	Mean	SD	Mean	SD		
Success	Ability	2.28 ^a	0.89	1.61 ^b	0.78	1.39 ^b	0.71	2,141	13.41 ^{***}
	Effort	1.92 ^a	1.03	2.21 ^{a,b}	1.01	2.5 ^b	0.9	2,141	3.816 [*]
	Teaching	2.31	0.79	2.58	0.7	2.37	0.72	2,136	1.62
	Task	3.37	0.98	3.43	0.91	3.6	0.64	2,138	.51 ^c
Failure	Ability	3.36	0.79	3.51	0.7	3.39	0.92	2,131	.38
	Effort	1.75	0.94	1.77	0.88	1.67	0.87	2,145	.19
	Teaching	2.17	0.76	2.28	0.8	2.37	0.8	2,134	.65
	Task	2.6	1.21	2.29	0.99	2.49	1.00	2,135	1.32 ^c

^c Homogeneity of variance assumptions violated- Kruskal Wallis used

^{a,b} Post-Hoc comparisons using Bonferroni corrections: groups with significant differences have different superscript letters

* $p < .05$, *** $p < .001$

No significant differences were obtained for teaching and task attributions of school success. With regards to all attribution types of school failure as well, no significant differences emerged between the three groups.

5 DISCUSSION

The act of reading may be considered a stressful endeavour for those with dyslexia (e.g., Carroll, Maughan, Goodman, & Meltzer, 2005; Thomson, 1996; Willcutt & Pennington, 2000) and may be perceived as challenging. Task-focused behaviours and others' attributions of success and failures may influence the likelihood of engaging in reading. Therefore, this study focused on examining task-focused behaviour and mothers' causal attributions of school success and

failure among 184 Finnish-speaking participants from the JLD study who were classified into three groups (dyslexia, typical readers at risk of developing dyslexia, and typical readers from the control group). Findings revealed that task-focused behaviour was not stable over time, in spite of accounting for the slight stability from age 8 to age 15, and the three groups differed only at age 8. Furthermore, there were some significant relationships between mothers' causal attributions of their 15-year old children's school success and failures and task-focused behaviour at age 8 and at age 15. No significant relationships emerged between mothers' causal attributions and task-focused behaviour at age 20. Comparisons between the three groups yielded that the groups differed on ability and effort attributions for success; with higher ability attributions made by mothers' in the dyslexic group than the other two groups, and lower effort-based attributions than that of the control group.

5.1 Stability of task-focused behaviour

The findings partially supported the first hypothesis that task-focused behaviour will be unstable from age 8 to age 20. However, task-focused behaviour was found to be somewhat stable from age 8 to age 15 but not at age 20. Instability or changes in task-focused behaviour could be due to age-related experiences. Several research studies have supported this finding by highlighting that task-focused behaviour in general changes over time (see for e.g., A.E. Gottfried, Fleming & A.W. Gottfried, 2001; Lau, 2009; Zanobini & Usai, 2002). For instance, Hirvonen et al. (2016) demonstrated stability of task-avoidance in the early years, that is from Kindergarten to Grade 2; but, there was a subsequent decrease from Grade 2 to Grade 3. Irrespective of cultural context, task-focused behaviour seems to be subject to change as age increases. Jozsa et al. (2014) found that cognitive persistence, measured by self-reports of on-task behaviours exhibited on school tasks, among Hungarian Grade 4 students changed four years later when again assessed at Grade 8. Similar results were also found among Chinese students, from Hong Kong, in Lau's (2009) study, among

Italian students in Zanobini and Usai's (2002) study, and among students from USA in Gottfried, Fleming and Gottfried's (2001) study.

There seems to be a consensus among these studies that task-focused behaviour is expected to be unstable primarily due to resulting age-related experiences like changing social circles, academic environment, family environment and background, and other person-related factors. Instability may also be a result of adolescence. Adolescence is a time when roles transition (e.g., Brown, 1990), new social circles are formed and new identities are formulated (e.g., Brooks-Gunn & Reiter, 1990), and decisions are made in the face of environmental demands that can limit or enhance opportunities later on (e.g., Brown & Mann, 1991).

5.2 Dyslexia and task-focused behaviour

This study attempted to investigate the link between task-focused behaviour and dyslexia and thus, examined differences of task-focused behaviour among those with dyslexia, typical readers with family risk for dyslexia, and typical readers from the control group. In accordance with the study's hypothesis, findings revealed that the groups differed on task-focused behaviour at age 8 but not at age 15 and age 20. At age 8, the significant group difference was a result of differences between the dyslexic group and the control group. These findings are consistent with results from the Lepola et al. (2000) study of Finnish children differing in reading ability, revealing that those with poorer reading ability in grade 2 engaged in more avoidance, marked by social dependence coping (behaviours like helplessness) than those with better reading ability. Furthermore, no significant differences were obtained between the at-risk group and the control group, and the dyslexic group and the at-risk group. These findings are aligned to those of Fyrsten et al. (2006) wherein membership to the at-risk or control group did not particularly predict task-avoidant behaviour implying no differences between the groups in the association of task-focused behaviour and reading skills. It is important to note that despite having the same sample as the

present study, the participants were younger and did not have a diagnosis yet. Additionally, Eklund et al. (2013) found that task-focused behaviour served as a protective factor for the development of reading disability. They found that Grade 2 children having a high risk for dyslexia without reading disabilities were more task-focused than their counterparts with reading disabilities, and those having a low risk for dyslexia with reading disabilities were more task-avoidant than their counterparts without reading disabilities. These findings are not aligned to the findings presented in this study, in that there were no differences between the at-risk and dyslexic group, perhaps because of a different grouping method used.

The finding that there were no group differences at age 15 and age 20 could be suggestive of the nature of Finnish orthography which is transparent (Seymour et al., 2003). Since, reading in opaque orthographies could be construed as demanding, task-focused behaviour is associated with reading more in opaque orthographies than in transparent orthographies (Manolitsis et al., 2009). Hirvonen et al. (2010) reasoned that the nature of Finnish orthography could explain their finding that task-focused behaviour measured one year earlier, after controlling for prior reading skills, did not predict subsequent reading fluency. However, in the study by Polychroni et al. (2006), Grade 5 and 6 children diagnosed with dyslexia were more likely to engage in task-avoidant behaviours characterised by a surface approach on reading tasks. These differences between the groups could indicate other factors, such as varying school systems, poorer academic self-concepts, attitudes towards reading and adolescence-related factors such as increased use of self-handicapping strategies (Midgley & Urda, 1995). With regards to adulthood, no differences were found between the three groups on task-focused behaviour which were supported by Lockiewicz's, et al. (2014) findings. In their study, they suggested that insignificant differences between adult dyslexics and non-dyslexics could be due to career decisions that have limited reading opportunities made by high-functioning dyslexics.

Further analysis also revealed that a main effect for time was obtained for task-focused behaviour, but no effect was determined between the three groups and time on task-focused behaviour. Interestingly, across all three groups task-focused behaviour declined from age 8 to age 15 and subsequently increased after age 15. As noted in the previous section, task-focused behaviour has been found to change when transitioning from childhood to adolescence due to corresponding age-related experiences. In fact, these studies have demonstrated that task-focused behaviour declined during this period (e.g., Gottfried et al., 2001; Lau, 2009; Zanobini et al., 2002). In the study by Jozsa et al. (2014) of Hungarian children, task-focused behaviour not only changed but also declined from Grade 4 to Grade 8. Furthermore, decreased task-focused behaviour during adolescence can be explained by the use of self-preservation strategies to enhance their image (e.g., Midgley et al., 1995). As students go to higher grades, children are expected to master higher-order skills and to be able to meet more complex evaluative demands. Adolescents are more likely to use image-preserving tactics, that do not reflect lack of ability, in the face of difficult tasks. By using self-handicapping strategies, such as procrastination and wilfully not engaging in tasks (also considered task-avoidant behaviours), adolescents construct situations that hide their lack of ability (e.g., Garcia & Pintrich, 1993). The rising trend of task-focused behaviour observed after age 15 to age 20 could be due to a career path that the children are required to decide. The Finnish education system allows students to choose, based on their interest, to enter the academic stream or the vocational stream after Grade 9 (Finnish National Board of Education, 2010). They then are likely to be more invested in their choices which may further increase the likelihood of engaging in challenging tasks (Brown & Mann, 1991). Thus, more task-focused behaviours could have been reported at age 20.

5.3 Mothers' causal attributions and task-focused behaviour

There were some significant relationships between mothers' causal attributions of success and failure at age 15 and task-focused behaviour at age 8 and age 15. No significant relationships emerged between mothers' causal attributions and task-focused behaviour at age 20 for both success and failure situations. Findings revealed that task-focused behaviour assessed at age 8 was negatively related to ability attributions and positively related to task attribution in school success situations. That is, the more task-focused the child seems at age 8, the less likely mothers attribute success to their 15-year old child's ability, and the more likely mothers attribute success to task ease. The tendency to attribute success of task-focused children more to task ease, which is an external attribution, rather than to ability, an internal attribution, could perhaps be explained by the dimension of controllability. Ability attributions are perceived as uncontrollable, internal and stable (Weiner, 2000), where school success is viewed outside their children's control.

In addition, task-focused behaviour assessed at age 15 was negatively related to teaching attributions in both success and failure situations and positively related to ability in success situations. Simply put, the more task-focused the child seems at age 15, the lesser likelihood that mothers attribute success and failure to teaching (good or bad), and the more likelihood mothers attribute failure to the child's ability. Contrary to Aunola's et al. (2002) findings, it is interesting to note that there was no significant relationship between mothers' ability attributions of their child's success and children's own reports of task-focused behaviour. This could be suggestive of a lack of familiarity of their adolescent's child's task-focused strategies perhaps as result of adolescents' transition to independence (e.g., Brown, 1990; Brown et al., 1991). This lack of familiarity as the child asserts independence could also explain the absence of a significant relationship between mothers' causal attributions at age 15 and task-focused behaviour at age 20. It may also be that while reporting on their own task-focused behaviour, adolescents may have employed image-preserving

strategies (Midgley et al., 1995) that could have been unrelated to their mother's attributions of success and failure.

With respect to teaching-based attributions in school success and failure situations, its negative association with task-focused behaviour reflects a reluctance by mothers to attribute either success or failure to good or bad teaching. There could be two reasons for this that are unique to the context of this study. Firstly, it is commonly believed that teachers are highly trusted and regarded in Finland. Secondly, it may be that parents participating in the JLD study had knowledge of their children's development as they were kept abreast by the researchers. The second reason could also explain the tendency for mothers to attribute their task-focused 8-year old children's success to task than to ability.

5.4 Dyslexia and mothers' causal attributions

Based on research findings (Friedman et al., 1987; Johnston et al., 1998; Pearl et al., 1980; Rogers et al., 1985) it was hypothesised that the three groups would differ on the type of causal attributions of school success and failure reported by their mothers at age 15, with mothers of children in the dyslexic group attributing school success to external factors and school failures to internal factors. This study did not expect there to be any significant differences between typical readers from the at-risk group and typical readers from the control group.

Group differences were obtained on measures of ability attributions and effort-based attributions. Perhaps these differences could be related to differences in task-focused behaviour at age 8, especially since parents reported task-focused behaviour based on observations. In any case, mothers of those in the dyslexic group reported lower effort attributions than mothers of typical readers with a family risk of dyslexia and mothers in the control group. Also, they reported higher ability attributions than mothers of typical readers who were at-risk and control group. According to Weiner (2000), effort attributions reflect controllability and ability attributions are viewed as fixed and uncontrollable

(similar to talent). It is interesting to note that the lower effort attributions and higher ability attributions by mothers of the dyslexic group indicate that success is due to factors that are not within their children's control. Since, attributions are made based on observations of behaviours on task, it is likely that mothers of children with dyslexia view school success as outside their children's control owing to the nature of their difficulties (as in Hartley et al., 2013) contradicting the findings by Bryan et al. (1980).

Furthermore, while studies have demonstrated that parents of children with learning difficulties resort to external attribution in success situations and to internal attributions in failure situations (e.g., Friedman et al., 1987; Johnston et al., 1998; Rogers et al., 1985), this may not be true for adolescents, primarily because of adolescents' social environment (Prout, S.D. Marcal, D.C. Marcal, 1992). This can be explained by culture-specific child-rearing beliefs. According to Tulviste and Ahtonen (2007), Finnish parents deem "ability" to be an important child-rearing goal and therefore may resort to more ability-based attributions.

5.5 Limitations

When evaluating the findings of this study, it is important to note its limitations. Firstly, a small sample size for each of the three groups across the three age groups effects statistical power of this study. Secondly, while the JLD study was successful in retaining participants across time, there have been some missing cases, especially at age 20, which could have adversely impacted the results. Thirdly, the measure of task focused behaviour used in this study is generic and, as noted previously, task focused behaviour is found to be domain-specific (Miller, 2010). Specific to reading skills, reading behaviours and competence, a measure of the more specific reading motivation is preferable (refer Schiefele, Schaffner, Möller & Wigfield, 2012) especially since dyslexic individuals tend to compensate for their reading deficits by achieving in other activities (Lockiewicz et al., 2014). Finally, this study did not investigate the reciprocal cumula-

tive relationship of task focused behaviour and reading skills, so it is difficult to ascertain if reading skills predict task-focused behaviour or vice versa.

5.6 Practical Implications

The results from the current study indicate that while task-focused behaviour is linked to dyslexia, it does not remain stable as one becomes older. That is, differences in task-focused behaviour between those with and without dyslexia were obtained during childhood but did not persist in adolescence and early adulthood. These results can be viewed in a positive light especially since it implies that task-avoidance does not remain stable.

At an early age, reading requires effort, particularly among those with dyslexia and other reading difficulties. Thus, task-focused behaviour is crucial in the process of initial reading development until decoding becomes automatic. Among native-speakers of Finnish, decoding may occur relatively quickly because of its transparent orthography, thus requiring lesser effort to be able to read fluently. However, from a practical standpoint task-focused behaviour, during early reading experiences, can be fostered by providing tasks that have the most apt rigour (Miller, 2003); that do not exacerbate any stress associated with reading, resulting in early successfully reading experiences. Additionally, experiencing success in early reading endeavours can mitigate Mathew effects that may exist between skilled and less skilled readers (Stanovich, 1986).

Future research could investigate a much more domain-specific reading motivation among those with and without dyslexia and subsequently the long-term impact of the domain-specific task-focused behaviour on educational or occupational goal setting and attainment among those with dyslexia.

Furthermore, observations of behaviour while performing a task has the potential to impact evaluations made by close observers, such as mothers. These evaluations could be manifested in subsequent behaviours on a challenging task. From findings in this study, it seems that mothers seem reluctant to attribute success and failure of their task-focused children to good or bad teaching.

Moreover, it also seems that mothers' attributions of their adolescent children's successes and failures may cease to be related to early adults' task-focused behaviour. Future research in this field would be able to shed light on this apparent negative relationship between task-focused behaviour and parents' teaching-based attributions, and the absence of a relationship between parental attributions of success and failure their adult children's task-focused behaviour.

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